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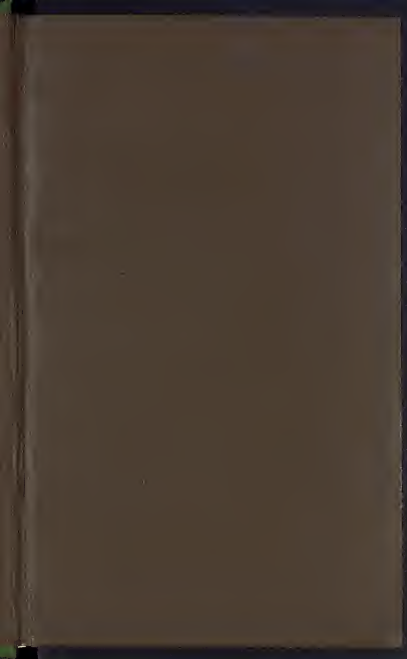
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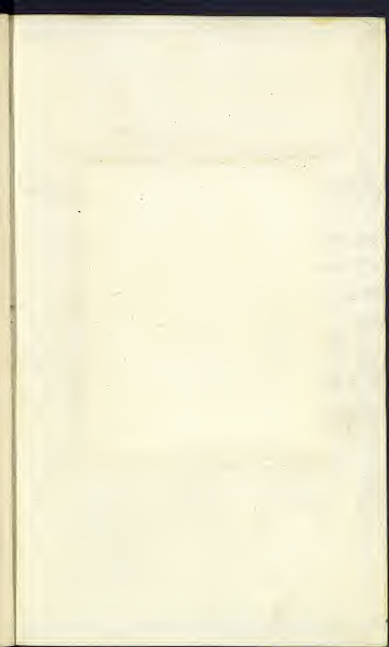


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Yours faithfully
J. P. Watson





HINTS TO STOCKOWNERS:

OR,

Short Remarks on some of the more
Important Departments of
Stock Management.

BY

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PREFACE.

IN the management of all pertaining to our domestic animals, there is, as a rule, too little attention bestowed in acquiring a knowledge of the natural habits of the different species, their adaptability to extrinsic circumstances, as also of those general laws in accordance with which the healthy exercise of animal function is maintained; while where this knowledge is possessed, it is much less frequently made practically available for the maintenance of health and prevention of disease than might be anticipated.

It does certainly seem anomalous that those who are not sparing of expense in the treatment of their

animals when actually suffering from disease, should fail to understand the value of advice which is given with a view to its prevention.

Veterinary surgeons are, and have been, too much looked upon merely as the agents or tools through which it is sometimes possible to reinstate sick animals in healthy or working condition, too frequently estimated by the test of how much they can cure, and too seldom employed as the conservators of health and in the prevention of disease. Feeling that this is a state of matters undesirable, and that the opposite is likely to be fraught with benefit to the animals placed under our care, and consequently also to the pecuniary interests of their possessors—as also that it is all but certain that we shall be more extensively employed in the direction of the prevention of disease in proportion as the profession occupies its legitimate position in that important division of social science, public health, of which it forms a part—the accompanying sugges-

tions are made as indicative of the more important errors, and the means by which they may, in part at least, be avoided, which are daily committed as respects the preservation of health and avoidance of disease amongst all our domestic animals.

On the different subjects touched upon a detailed or exhaustive treatment of any is purposely avoided.

The "Hints" are intended rather as suggestive : principles are endeavoured to be pointed out from which may be deduced rules for daily practical guidance.

In this light, and supplemented by the observation and reflection of those whose daily duty it is to minister to the comforts and wants of our animals, should they tend in any way to a more intelligent consideration of those relationships which must ever exist between the different species of stock which we possess and the circumstances in which they are placed, to a more rational comprehension of any of the functions of animal life or manifestations of

disease, and consequently to a more humane and successful management of both, the object of their writer will be amply attained.

KELSO, *September 1*, 1870.

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Hints to Stockowners.

LOCATION OF ANIMALS.

THAT the greatest amount of benefit may be obtained from those animals which, from necessity or other motives, we have subjected to our control, it is necessary that they be maintained in as full enjoyment of health as is compatible with their several dependant relationships. For the preservation, however, of animals in the full vigour of health, it is not merely necessary that they be kept free from the actual contagion of disease: they must also be protected from the adverse influences connected with situation, climate, diet, &c.

If diseases connected with location and nutrition

are not the most fatal of the maladies with which we have to contend, they are, in our domestic animals at least, the most widely spread and frequently encountered, and are also those over which we possess the greatest control. At the same time, it ought ever to be remembered that to those potent influences of location, food supply, and a judicious choosing of certain animals for breeding purposes, must be assigned the merit of having originated, improved, and maintained the many varieties of the different species of our domestic animals, and that to such an extent as almost to favour the idea of the formation of a new species. To a want of knowledge, or an utter disregard of the teachings of what may be considered as amongst the first principles of the science of stock-rearing—viz., *that there ought to be a just relationship subsisting between the animals we possess, and the situations and other extrinsic circumstances in which we place them*—may be traced many of the failures and disappointments which have attended the breeding and rearing of highly-bred stock. It is not everything that we possess fine animals, and otherwise give them every attention, if local and climatic influences are ad-

verse. They may be reared, no doubt—for these influences can, to a certain extent, be combated; but in the end such breeding will be found eminently unprofitable. Better is a good cross-bred animal than one ill developed and badly nourished, even though it should possess the recommendation of descent from the purest strain of blood.

Of local agencies having a determining influence, as well during health as in the production of particular forms of disease, that of the *soil* is probably the most important. Besides the direct and individual influence, so to speak, exercised by all soils on the animals bred and reared on them, there is also the indirect, operating through the medium of the grains, grasses, and roots which they yield. This character or condition of soil, again, and its adaptability to the maintenance of animal health or the opposite, is the result of many causes or agencies, natural and artificial, some of which are susceptible of alteration, while others are little affected by interference.

Geological Formation.—The substrata on which soils rest, and to which, in part at least, they owe their formation, is always an important element in

determining their character, and one which remains undisturbed in its permanence notwithstanding cultivation and the improvements of modern scientific agriculture. From an acquaintance with the nature of this formation we can in many cases predict what will be the character of the stock bred and reared on such lands, as also the diseases to which they are more particularly liable, or from which they are exempt. For example, it is a fact well known to the majority of our sheep-breeders that on certain soils, chiefly those resting on the igneous rocks, sheep are liable to suffer from a form of abdominal consumption commonly known as *pinning*, and that no system of treatment is so efficacious as their removal to soils resting on the sandstone formations. There are also diseases of particular structure of the animal body, as the bones and nervous system, *enzootic*—that is, confined to circumscribed districts of country—which seem to owe their origin to the redundancy, or absence, in the soil, and materials grown thereon, of certain organic or inorganic materials. These diseases are always difficult of prevention when only methods of cultivation, or systems of folding the animals on these lands, are

adopted. They would require to have access to those situations known to be dangerous only at particular periods, and to have what food is given them from such soils supplemented by other of a very different nature.

Drainage, amongst the greatest of modern agricultural improvements, has done much towards influencing in a favourable manner, directly as well as indirectly, the capability of all our soils for the healthy support of animal life. Superabundant moisture (always an agent inimical to health) is removed, temperature is heightened, and their products rendered more healthfully nutritious. These results have been most apparent on lands naturally stiff and retentive, and which, previous to the adoption of a thorough system of drainage, were notorious as being ill adapted to the rearing of any description of stock—diseases of a malarious and rheumatic nature, or specific affections of the digestive and assimilatory systems, being of such undesirable frequency as to render the breeding of stock extremely uncertain, and consequently unprofitable. Notwithstanding these obvious and admitted advantages of

a judicious system of drainage, there is an opinion prevalent amongst a large portion of even well-informed stock-breeders that lands in themselves naturally soft and damp, marshy, or boggy are particularly well fitted for the breeding and rearing of horses—this dampness being, it is imagined, favourable towards the healthy developement of the important structures of the hoof. This opinion is, however, a mistake, and will be found, on investigation, not to stand the test of experience. In certain conditions of disease moisture may be beneficial; but for the healthy growth of the feet of the young animal the very opposite is the case. The best feet and legs, because the healthiest, are met with in animals bred and reared, as their progenitors have been, on our driest soils. In this light the soils of the chalks or limestones, the porphyry and greywacke, will bear favourable comparison with the fen or marsh lands of Lincolnshire, or the bogs of Ireland. Horses bred from families which have been reared for a succession of generations on wet or marshy lands not only acquire an abnormal expansion of the feet, flatness and weakness of the sole, with a want of firmness and tenacity of the crust

wall, which are unfavourable to the endurance of hard work, but shew, in addition, the deteriorating influence of this condition of soil in the flabby, soft state of the whole muscular system, are pot bellied, with legs disposed on the slightest provocation to dropsical swellings. The grasses grown on these lands, although abundant, are apparently deficient in nutritive elements, difficult of appropriation, and apt to induce a faulty condition of the digestive and assimilatory systems.

Increase of manurial richness in lands, an almost invariable accompaniment or result of a system of thorough drainage, has at the same time resulted in the production of influences markedly determining both the extent and character of disease in animals reared under these conditions. This is earliest and most notably visible amongst our sheep stock, that class most closely and constantly in contact with these influences.

On our best and most highly cultivated lands, if we except the occasional occurrence of *epizootics*, the great mortality in our sheep stocks, as well as cattle, arises from faulty dietetic conditions—fatal

blood disorders—a disturbance of the equilibrium which ought to subsist amongst the several functions connected with the preparation of food and its manufacture into healthy nutritious material. *Splenic apoplexy, quarter ill, braxy*, and those varied affections in sheep characterized as “*sickness*,” may all be viewed as diseases of the dietetic class, and can only be successfully combated when dealt with by means operating in this direction—the establishment of the normal functions of digestion and assimilation.

The reclaiming and improving of our lands, pasture and arable, has naturally resulted in an increase in the quantity and quality of our supplies of food for different classes of stock, this increase of food supply at once suggesting and rendering possible the very great changes which have been made in supplanting the more primitive by the more highly developed but more artificial breeds. In many cases, however, these improved breeds, notwithstanding all the additional accessories of diet, are not profitably maintained unless by adequate shelter they are protected from the damaging effects of sudden and great atmospheric changes. In breeding stock, young stock—and in the spring of the

year this is more particularly needful to attend to—no amount of feeding is sufficient compensation to this class of stock for exposure to sudden withering blasts of snow or rain. These not only prevent the greatest amount of benefit being obtained from the food consumed, but are powerful exciting agents of much actual disease. Of the exact nature or form in which this shelter ought to be provided every stockowner must be the best judge, seeing many things fall to be considered, as productive capabilities, physical character of the soil, variety of stock for which this shelter is required, &c., of which he only is in a position to form a correct estimate.

Stabling.—If damage is apt to result to the health of stock, and consequently to the interests of stock-owners, from a want of a just appreciation or a wilful neglect of the importance of the fact, that for the healthy rearing of animals there ought to exist a mutual relationship between these and their conditions of location as to soil, at least equal damage is likely to attend similar errors committed respecting location as to stabling. With no stock, either when roaming unconfined or enjoying the advantages of shelter,

can any of the great general laws of health be infringed with impunity. For certain classes of our stock, stabling, or a sufficient shelter, may be deemed a necessity during the greater part of the year; for others, this necessity only exists during particular and restricted periods. For all, in order that the adverse influences of confinement may be reduced to the minimum, this stabling or shelter ought to be provided and maintained with a view to the attainment of certain definite ends, some of the principal of which are—1. *Good position*—a position such that atmospheric changes shall affect the animals as lightly as possible, it being remembered that these vicissitudes are more likely to operate prejudicially upon them under confinement than when allowed a full amount of freedom. 2. *Sufficient ventilation*. This has always been a difficult subject; nor is it necessary that the advantages or demerits of the different systems employed be considered here, it being ever remembered that, whatever method is adopted, a regular and sufficient supply of pure air ought to be maintained for the animals' consumption, together with ready means for the removal of the exhausted; while in the case of horses ample space and regulation of

temperature are almost necessary accompaniments. 3. *Thorough cleanliness*, through means of adequate drainage and the removal of all deleterious animal and vegetable matter: this end is much expedited by the free use of disinfectants. 4. *Light*: the importance of this, save as respects animals which are being rapidly fed, is not likely to be doubted: it is not only cheerful and health-giving in itself, but indirectly is an enemy to all untidiness and filth.

In addition to these conditions of stabling or shelter, which may be looked upon [as absolutely needful for the healthy maintenance of animal life, with certain classes of our animals, horses in particular, individual cleanliness—a regular and careful attention to the condition of the skin through means of grooming—is particularly deserving of attention, as being subordinate only to the more universally applicable laws of health.

When these common and generally approved sanitary conditions of stabling are neglected, health is impaired, life being maintained in a weak and vacillating condition, and animals may actually become the victims of disease engendered by the continuance of these depressing and baneful influences; while at

all times the system offers a ready and suitable resting-place for the seeds of any infectious disorder which may be encountered. In addition to this increased susceptibility to contract infectious diseases, and their less disposition to respond to treatment, there is also in such cases of defective sanitary arrangements a general tendency for affections usually simple to assume a malignant type.

FEEDING OF ANIMALS.

IN the feeding of our domestic animals we have not merely to do with those where this food supply is required only for what may be considered the normal purposes of animal life—the growth or developement of the animal framework, and the supply of the waste of tissue incident to the performance of animal functions : we have, in addition, to deal with such where this food is understood to be in excess of both of these demands, and where this excess is endeavoured to be pushed to the utmost limits to which it is possible.

Participating in the hot haste in which everything in the present day is accomplished, and endeavouring to meet the demand for an increased supply of animal food for a rapidly-increasing population, stock-feeding is not now the calm and leisurely waiting for animal developement it formerly used to be. With

as much propriety it may be characterized as the manufacturing of beef and mutton. Not content with preparing for the market one set of cattle during the feeding or root season, their boxes or stalls must be refilled two or three times. Nor is what used formerly to be considered as the natural food of these animals—the produce of the lands where they were reared given in full amount—now thought sufficient for the attainment of the ends aimed at. The most highly-nutritious materials, aided by the regular and systematic employment of digestive stimulants, is continuously given. All these conditions have of necessity a determining influence on the health of animals so circumstanced.

If we except the *epizootics*, and one or two *parasitic* diseases of sheep, by far the larger proportion of the maladies met with in this class of stock—those kept for the production of animal food—are connected with, or immediately proceed from, faulty conditions of the assimilatory and digestive functions.

Probably in every class of our domestic animals, the individuals which receive the greatest amount of damage from being injudiciously fed are precisely those upon which most attention and care ought to

be bestowed in order to guard against any injurious results—viz., our breeding animals.

The males of our higher bred stock are, as a rule, too much pampered, and too often fed to a point bordering on plethora—a condition in all animals favourable to, and in many involving, disease. This is particularly noticeable in our better class sheep, animals which stand this treatment worse than most others. Many a breeder, after having at considerable sacrifice obtained what he imagined were promising animals, has had his hopes cruelly blasted by finding that, if not perfectly impotent, their powers of procreation were certainly materially weakened, or they were subjects of premature disease. In some cases, indeed, the results have even been worse—in the begetting of stock enfeebled in constitution and predisposed to disease. It is certainly needful that these animals should be well fed, but not at all necessary that they should be plethoric—that to this feeding should be sacrificed the full and healthy developement of the organs of locomotion, as well as those of respiration, circulation, and digestion. The females, again, are not unfrequently made the subjects of an experiment in dietetics, whereby it is

sought to be discovered how far it is possible, compatible with health, or in some instances bare existence, after conception, to allow them to fall off and still leave sufficient time for their being brought into what is considered a proper condition immediately previous to parturition. Such treatment is a fruitful source of mischief, and deals damage in a double form, first with the dam, and second with the *fœtus* or progeny.

With horses, store cattle, and sheep, while the inducements to err in dieting from repletion and over stimulation of the digestive organs by fits and starts are less, and diseases of *plethora* or over-balanced circulatory system are fewer, they are nevertheless sufferers to a greater extent from injudicious dieting than, with a little care, they ought to be. Cases where the amount of food supplied is deficient, followed by diseases of *anæmia* or pure poverty, certainly do occur : they are, however, rare as compared with those where the fault is to be found, not with the amount of food given, but with the manner in which it is given. Over a given period of weeks or months the amount given may be perfectly sufficient for the animal wants if this were allowed with regu-

larity day by day. It is, however, given in excess one week or month, and the animal has more than it can appropriate, while the succeeding it is withheld, and then is barely sufficient for the increase of growth or the supply of what has been removed as waste, far less for both. Or, again, there is forgotten those causes which operate either from within or without the animal, as temperature, work, period of gestation, lactation, &c. The *quality*, too, may be deficient. It is mistaken economy, most certainly, to supply animals with food of an inferior or damaged nature, as is too often done, and reckon it for so much of a superior quality. When given, it ought to be as such; while certain classes, as horses, are infinitely better without it, in receiving a smaller amount of sound nutritious material. On these animals it will not even produce the nutritive results it might accomplish in others, but will most probably result in the production of certain depraved or diseased conditions.

The *form*, as well as the quantity or quality of food given to animals, is deserving of being considered. For the rapid and economical feeding of all varieties of stock it is well known that they must

not only have a full supply of the best materials, but this must be presented to them in such a condition and form as will best fit it for rapid digestion and assimilation. For this purpose benefit may always be derived from a mixture or commingling of a variety of feeding materials, a proper trituration or grinding of the harder, with an occasional altering of their character by fermentation, cooking, or flavouring. *Chopping of fodder and bruising of grains* will, in the case of all classes of farm horses, pay well for the time and labour, while with many it is absolutely necessary in order that the full amount of nutriment may be obtained from these materials. Of these processes the latter is probably open to the more cogent objections, seeing that horses fed on bruised grains, when put immediately to severe draught, seem to be more liable to that fatal lesion, rupture of the stomach, apparently from the rapidity with which the digestive fluids act upon materials in this condition, the elimination of gases, the difficulty of eructation, and consequent tension on the coats of the organ. In all farm stables there is no material so much wasted as uncut fodder, there being generally about one-third destroyed and removed with

the litter. All this, however, is saved by chopping.

Cooking of grains for horses, and mixing of these with such roots as potatoes, mangold, or turnips similarly treated is, as a rule, not to be recommended. While it may be carried to a considerable extent with perfect impunity, and even benefit, in young and idle animals, its employment is attended with much annoyance and danger in those which are actively engaged in work. The digestive apparatus of the horse is not well adapted for food of this variety, which, together with the mode in which it is given—either in too large quantities, or too old as to the time of its preparation, or too hot—frequently results in indigestion, or more serious affections of the stomach and bowels. Nor are these risks compensated for by any increase in the nutriment of materials thus treated, an idea long entertained, but which has not facts sufficient to substantiate it.

BREEDING OF ANIMALS.

THERE are few who, knowing anything from experience regarding the breeding of animals, if questioned, will deny the general truth of the statement "that like produces like;" still, there are many even of these same individuals who, in daily practice, are found ignoring its teachings—at least they act as if it had no particular applicability to horses. If it is true, as all evidence seems to point to its truth, that not only external conformation, but the character of internal organs and peculiarities of temper and disposition, are transmissible from parent to progeny—that the son may inherit from the sire a body symmetrical and proportioned, or ill formed and ungainly, the actual seeds of disease, or organs and structures predisposed to become diseased, or, probably even more, individual and acquired excel-

lencies—the *selection of parents* is surely deserving of more attention than is often given to it.

There is no doubt but that, properly speaking, in the choice of breeding animals, both sire and dam ought to be selected with equal care : indeed, when stock animals are again to be bred this is absolutely necessary. With horses, in many of their classes, it is, however, the male only which seems to attract any attention : the female, although incapacitated by disease or age, is looked upon as good enough for breeding from. Probably for the majority of purposes for which horses are ordinarily bred it is only necessary or possible to determine with certainty the claims of the sire to the character of purity of blood or descent in the breed to which he belongs. Following this, however, equal precautions must be exercised in the choice of both parents, or little satisfaction is likely to result in the offspring. The animals intended to be bred from ought, as a matter of course, to be the best the breeder is able to obtain. It is needless endeavouring to particularise what is comprehended in the term “the best,” seeing that although most men will differ little regarding what may be termed a *good* and a *bad* animal of any class,

there is yet some difficulty in obtaining agreement amongst any number of men as to what may constitute the ideal of perfection, more particularly in horses. They ought to have reached maturity, be in the possession of vigorous health, and have perfect freedom from any hereditary disease, or even predisposition to it: preference ought also to be given to docility and tractability of temper. It is curious to observe the caution with which our breeders of sheep superintend the introduction of any fresh blood amongst their already highly bred stock—how they criticise the quality of the bone, the form of the ribs, the length and expression of the face, the setting of the ears, the character of the neck, with the amount and quality of the wool; and to see the easy indifference with which they at the same time set aside as fit for breeding purposes horses with such patent hereditary defects as roaring, badly formed limbs or feet, and diseased joints.

Amongst our domestic animals all that is generally necessary for fruitful connection is, that they be in the enjoyment of health, and that attention be paid to the period of heat.

According to certain statistics it has been made to appear that a larger proportion of male animals is the result of copulation allowed while the heat is passing off the female, as also when the age of the female is much in excess of the male. Where inaptitude to conception appears in the mare which has not yet bred, and it is certain that the cause does not rest with the stallion, some experiments seem to point to more successful results from manipulation and dilatation of the mouth of the uterus with the naked hand.

Conceptions are generally more certain and fruitful when females are receiving a somewhat improving diet; while following conception, and during the earlier period of gestation, they are rather disposed to improve in condition. Acting upon this knowledge, the treatment of certain of our breeding stock, ewes in particular, is often exceedingly unnatural, and the fertile source of much disease and loss amongst both these and their produce. It has often appeared to me that the treatment of these animals at this particular period might be very readily resolved by stating it in the form of a simple question—Whether, if, after having made a selection of rams from a

stock of sound and approved constitution, ewes were less suddenly and highly forced at the period of conception, and then kept steadily progressing—resulting certainly in a smaller number of lambs being born, most probably (I could almost say certainly) a lower death-rate of both ewes and lambs—the remuneration would not be greater than with a larger crop of lambs and an immensely higher per centage of loss in old as well as in young, not considering the deteriorating influences such irregularity of dietetic arrangements have ultimately on the constitutions of succeeding generations?

There is little fault to be found with those who, in their management of this stock, act upon the opinion that during the early period of *gestation* the ewe can healthfully and profitably subsist on a diet less nutritious than is needful for her either immediately before or some time subsequent. It is where this lowering is carried too far—when the economising of food is too rigidly enforced—that those mischievous results alluded to most commonly occur. Towards the latter part of the period of *gestation* the *fœtus* is acquiring a magnitude which calls for material support from the dam, which, when neglect

or parsimony withholds, must be drawn from the internal resources of the parent, much to the detriment of the constitutional vigour of both mother and *fœtus*, which no amount of after-liberality in dieting can reinstate.

The exact manner in which irregularity, or fits and starts, in dieting operates detrimentally on breeding ewe stock is not invariably the same. Three particular manifestations of it, however, are deserving of notice, as well from the frequency of their occurrence as the fatality of their results.

1. *Arrested fœtal developement, with the presence of one or more dead fœtus*; 2. *Cerebral congestion*; 3. *Anæmia*. These generally occur as to time in the order they are mentioned, but are fatal in their inverse enumeration.

It is not difficult to understand how the first of these results of irregular dieting—viz., *arrested fœtal developement, with the presence of one or more dead fœtus*—proves fatal to the mother. It is generally found, when the ewe has more than one *fœtus*, that she has been, at conception, in an improving state of body, attended as a natural consequence with much functional excitement, but being

shortly removed to a comparatively sparse diet, and kept on such for too lengthened a period, the system of the mother is unfit to nourish this extra *fœtus* in *utero*, which is thus doomed to death, but is rarely expelled until parturition occurs. If, however, not one only, but all the *fœtus* are so far arrested in development as to terminate in death, immediate and premature expulsion will follow, constituting what is known as "abortion" or "slinking lamb." Although this irregularity of dieting is mentioned as one cause of the presence of dead lambs at the natural period of birth, it must not therefore be concluded that it is the only one operating to produce this, or even ordinary abortion; while the latter of these, whether occurring from mechanical injuries, constitutional disorders (inappreciable save by their results), or other agencies operating on the system, and thereby on the uterus, is rarely productive of dangerous consequences to the ewe. The presence at birth of a greater or less number of dead lambs, where there are numerous cases of twins or triplets, would of itself be a matter of little moment, were it not in this instance connected, as the exciting cause, with the death of the ewe. This it does

frequently by the retention of the *fœtal membranes*, which, becoming decomposed, produce by being absorbed low fever, and this in an animal already exhausted is a matter of serious import.

2. *Cerebral congestion* almost invariably occurs towards the end of *gestation*, when the ewes, after having been kept on a very moderate diet during the winter, are being more liberally treated, so as to ensure, it is thought, a more vigorous progeny, and a more abundant supply of milk when these are born. Here it is not the liberal diet that is wrong, for ewes really require such : it is its amount in relation to the extent of, or following, the preceding lowering treatment. This liberality of dieting of necessity resulting in an increased volume and somewhat altered composition of that which is the life—the blood,—this fluid is sent careering with more than usual vigour through its appropriate channels. The brain, always and in every condition an organ susceptible to congestive action and actual effusion of blood, is peculiarly so during the period of *gestation* and immediately previous to the act of *parturition*. The predisposing cause is the *parturient* state ; the exciting, the dietetic stimulus. *Coma*, or insensi-

bility, with the power of voluntary motion either perturbed or entirely lost, are the characteristic features of this affection. When able to move, the animals stagger forward with head erect and eyes protruding. Complete paralysis, with the death of the *fœtus*, are the usual results.

3. *Anemia*, the most destructive of the results mentioned, is only to be met with or expected in its most fatal form when the stinting process has been carried to such an extent that no amount of dieting will restore the ewes to vigorous health previous to parturition. It is then that the excessive demands upon the system during *intra-uterine* life, followed by the weakening effects of lactation, begin to produce their natural results. The animals gradually become more emaciated, at length cease to receive the food offered, no matter of what quality; they become "poked," as the œdematous swelling beneath the jaw is termed, and the eye and visible mucous membranes have a blanched appearance, exactly resembling the disease known as "rot," the principal difference in the affections being that they owe their origin to different causes. In truth, I believe the

former has not unfrequently nor inappropriately been described as "Hunger Rot."

As to the course of treatment most appropriate on the manifestation of these maladies, seeing that here, as with many other disorders, prevention is not only better but easier than cure, it is consequently of the first importance that intelligent and careful attention be directed to the entire general treatment of parturient ewes. In addition to a fair amount of exercise, their diet, in particular, ought to be as free as possible from those periods of sudden and great stimulation during conception, followed by a more lengthened period of restriction, to be again replaced by a diet of fulness and repletion. When a dead *fœtus* is removed from a dam, either through the act of abortion or parturition, or by manual interference, the same line of treatment is indicated as respects the mother. Support, if necessary, the system by appropriate dieting, or probably the exhibition of such stimulants as ale or spirits may be found needful. If parturition is successfully accomplished, a certain amount of local treatment is also sometimes advisable. The *uterus* and *vagina*, especially if there is much

of a disagreeable discharge from them, had better be syringed with tepid water and a mild solution of chloride of zinc, or permanganate of potass, which will not only destroy the fetor, but give to the secreting membrane a tendency to healthy action.

Cerebral congestion, wherever occurring—for it ought to be remembered that it will occur not only amongst ewes which have been stinted and afterwards fed to the full, but also in those which all through gestation have been kept on a good and nutritious diet, it being only necessary for its developement at parturition that there be an exaltation in the functional activity of those organs connected with the formation of blood, an increase in quantity, and richer and more plastic materials—must have directed to it all our endeavours to correct this alteration of the circulating fluid, and if possible obviate or restrict its tendency to effusion. Depletive measures—the abstraction of blood and the exhibition of purgative medicines—have been deemed by some the first requisites. But although good effects have been observed from the employment of the former of these, it is not advisable that it be pushed too far, seeing that although we can by this means lessen the

whole amount of the circulating fluid in the system, we cannot deal with the blood but as a whole—we cannot deprive it of those elements which are here believed to exist in preponderating amount. The bowels must be assiduously attended to, as they are generally found in a state of constipation or torpidity, less amenable to the action of purgatives than when confined from other and more ordinary causes. The exhibition of neutral salts, such as sulphate of soda and nitrate of potass, to those of the flock not exactly suffering, would have a tendency to produce a correct reaction in the blood. They have this to recommend them, the animals will take what is needful—small quantities in this case being better than large—sprinkled upon their food. The application of a smart blister to the back part of the head of those affected has sometimes, if applied before effusion has taken place, seemed productive of much benefit; while, when the earlier symptoms have disappeared, the after support, by the judicious administration of stimulants, may tend to reinstate the animal in its usual health. They are, however, very doubtful cases.

In dealing with those instances of *anemia* which

are ever the result of decidedly bad management in dieting—the ewes, immediately after conception, having been allowed to become so far reduced that the improvement in their feeding comes too late to rally the system ere the depressing influences of lactation have begun to operate—if any are to be saved, it must be by good nursing and careful regimen. Shelter must be provided from the vicissitudes of the weather, and food of the most nutritious and readily-assimilated nature given often and in small quantities. Common salt and some of the preparations of iron may with benefit be added.

There are many of our most valuable ewes on our best lands, if not kept during the whole time from conception until parturition on a full and generous diet, are at least during the greater portion of this time supplied with a full quantity of turnips, first on their pastures, and latterly on the land where these are grown. As it is well known that our Leicester ewes are voracious feeders, and also that exercise is absolutely necessary to the enjoyment of health in all pregnant animals, breeders have endeavoured to counteract the evil effects of this propensity

on the one hand, and on the other secure as far as possible the advantages resulting from the observance of the laws of health, by removing their ewes from the turnip brake during the day, and returning them at sunset. Could we ensure that during the day-time, while on their pastures, the stock were kept moving about as they are wont to do when ordinarily grazing there, it were all very well, and the object would be attained. In the most of these cases, however, the amount of exercise taken by the ewes is insignificant. The inducements for them to roam in search of food over the pasture lands is small. There is little calculated to please their palates after they have been folded on turnips, and they very soon seem to acquire the knowledge that in a few hours they will be taken to the roots left in the morning. The consequence of this is, that when driven from the turnips they quietly rest themselves by the side of the fold until the hour returns when they are again admitted, when, with appetites quickened by their self-imposed fast, they determinedly gorge themselves with enough upon which to rest and ruminate until the period again occurs for the repetition of the act. In this way are the principal objects sought to be

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obtained by this division of time between pasture land and turnips to a great extent, if not altogether, lost; and another train of consequences very undesirable is the result of the repeated gorgings to which the animals become addicted.

There are several affections quite common amongst our better fed ewes, and on our best lands, easily enough traceable to these repeated gorgings or filling to repletion of their capacious digestive organs. Of these the most common and least difficult to understand is that which is generally recognised amongst shepherds and flockmasters by the term "*breaking down*"—a rupture of the muscular walls of the abdomen. This, in its milder forms, is not regarded as a serious affair, seldom proving fatal to either ewe or offspring, although it certainly does materially lessen the value of the former as a breeding animal. In the more severe cases, however, it is not unfrequently the precursor of, or associated with, one or more dead *fœtus*, and a difficult, protracted, and dangerous parturition, usually resulting in the death of the mother. Although such cases may be treated, and in the milder forms successfully, more profit is likely to accrue from attention bestowed in consider-

ing the *rationale* of that process by which this result—the rupture of the abdominal walls—is reached, that thereby knowing the cause, means may be the more surely adopted for the prevention of this mischief. It is wonderfully simple, and probably purely mechanical. The ewes thus affected are generally pregnant with twins or triplets, while, as gestation advances, the gravid uterus attains a considerable bulk and weight, which, in connection with a capacious paunch, distended with a rather bulky material (turnips), proves too much for the natural resistant power of the abdominal muscles. It is also to this mechanical pressure of the digestive organs on the contents of the womb, and the presence in them of a bulky material at a temperature much below the normal standard of the animal body, that we must look for the cause of much arrested *fœtal* growth, death, and premature expulsion. As a corrective of these results, some system might be adopted by which, in part at least, the evil results of this full dieting of turnips would be avoided—viz., through the employment, to a certain extent, of some material less bulky and more nutritious. There is, no doubt, an objection to the use of such on the score of

expense: still, a substitute, in part, of good linseed cake and hay might be profitably employed, as respects those animals, at least when somewhat advanced in gestation, which are apparently to give birth to twins or triplets.

In addition to what has been mentioned as the evil results of errors or irregularity of dieting in breeding ewes themselves, there ought to be taken into account the influence these same causes exert upon their future progeny, even when that influence has not been so far detrimental as to result in death previous to or at parturition. We can easily understand, from the intimate connection existing between mother and *fetus*, that any constitutional change or disturbance taking place in the former must have an influence on the latter. The sudden alternations from *pletbora* to *anæmia*, and from *anæmia* to *pletbora*—from a sufficiency of exercise to a lazy recumbency—cannot be undergone by pregnant ewes any more than by other animals without detrimental consequences to the health of their future progeny.

The peculiarly fatal *congestive sanguineous* disease of lambs which has of late years been extensively distributed seems undoubtedly to have its origin

during *intra-uterine* life, in connection with certain peculiar changes occurring in the maternal blood, upon which the *fœtus* is immediately dependent for its developement and life.

Parturition.—In superintending the performance of the act of parturition in all our domestic animals, there are certain little niceties well deserving of attention, damage not unfrequently resulting from undue interference with the course of natural labour.

Manual assistance, as a rule, should not be had recourse to unless there is something abnormal relating to the mother, the *fœtus*, or the presentation—unless there is a malformation of the *pelvis* or other parts of the organs of generation, monstrosity, death, or malpresentation of the *fœtus*; nor in natural labour with defective *uterine* action until there is rupture of the *fœtal membranes*; and in no case if the attendant has previously been in contact with morbid animal matter.

As regards the *placental membranes*, or after-birth, if not expelled shortly after the accomplishment of the act, they had better be removed by the hand, seeing that when retained in the uterus after

the natural contraction of that organ they are a fruitful source of constitutional poisoning and putrid fever.

Immediately following parturition in all animals, even when that act has been accomplished naturally and without mechanical interference, several diseases are apt to occur which all claim a relationship to this important and critical act of the animal life as a predisposing or exciting cause.

Uterine and vaginal hemorrhages, commonly known as "flooding," occur immediately following the act of parturition, and when not destructive of life by fatal syncope, generally arrest for some days the secretion of milk, and necessitate some extra care being bestowed on the animal. They are best treated by *plugging*, and affusion of cold water over the loins. The former is performed by the insertion into the uterus of a good-sized towel or handkerchief, which should be retained there for a considerable time.

Of greater importance than these, both from its fatality and frequency, is the disease known and recognised in cows by the term "*parturient or milk fever*," and in ewes by that of "*inflammation*." In the former

of these animals the disease generally appears in one of two forms: first, the *apoplectic*, where the *lesions* are found in connection with the great nerve centres, the brain and spinal cord; second, the *abdominal*, in which the changes are associated with the organs within the abdomen, the womb, bowels, and lining membrane of the cavity.

In ewes the fever almost invariably takes the abdominal form, and in them is more to be dreaded from the apparent capability of propagation from the diseased to the healthy.

When occurring in cows both of these forms may be looked upon as fatal in proportion to the proximity of their appearance to the act of parturition. They are also more to be feared in animals which have reached maturity, are good milkers, perfectly free from any other disease, have had an easy parturition, or previously been subject to an attack.

Both forms are characterized by the suddenness with which the symptoms appear, the rapidity of their course, and general fatal termination.

The *apoplectic* form is ushered in by staggering gait, want of control over the voluntary movements, staring eyes, full pulse, and sterorous breathing, ac-

accompanied, or more properly preceded, by diminished secretion of milk and torpid bowels. Very shortly the animal becomes unable to stand, loses consciousness and the ability to swallow, wildly dashing her head from side to side. Death, in the worst cases, rapidly results from the extensive organic changes in connection with the brain and anterior part of the spinal cord, involving arrest or fatal impairment of functions essential to life which depend for their healthy existence on the integrity of these centres. When the *abdominal* organs alone are implicated there are the common symptoms of diminished secretion of milk and torpid bowels, accompanied by much fever, restlessness, and accelerated and hard pulse : there is, however, no coma, but gradually increasing pain. Occasionally cases will be met with where both forms seem combined : in these the cerebral symptoms will generally predominate.

All these cases, when seen early, or while the pulse is possessed of sufficient volume, are judiciously treated by blood-letting and the exhibition of purgative medicine. For the apoplectic form a suitable draught may be formed with sixteen ounces of

Epsom salts, one drachm of croton seeds powdered, half a pound of linseed oil, and two bottlefuls of gruel. This ought to be followed every three or four hours, until a result is obtained, with some diffusible stimulant, such as from two to four fluid ounces of solution of carbonate of ammonia in one or two pints of good ale and as much cold gruel. Benefit will also be derived from a smart blister applied to the back of the head, and the use of warm water *enemata*. For those cases where the abdominal organs are mainly involved, it will be preferable, probably, to leave out the croton, and double the quantity of oil; and instead of the ammonia solution, give every four hours four fluid ounces of sweet spirits of nitre, half a drachm of camphor, six fluid ounces of solution of acetate of ammonia, with fifteen drops Fleming's tincture of aconite, or, instead of this latter, in every alternate draught two fluid ounces of laudanum. Hot water applied continuously for some hours through the medium of woollen cloths to the abdomen, and afterwards followed by a mustard or turpentine application, will be found to answer well.

Although a fair per centage of cases of *puerperal*

fever treated in this manner will recover, more satisfaction will result when attention is directed to the management of parturient animals with the view of preventing its occurrence; not that there is any specific medicinal or dietetic which, if employed, shall operate thus favourably in every case, rather that experience most certainly teaches that by simple but judicious means much can be done to render it of less frequent occurrence. Let the animal, some weeks previous to parturition, have a fair amount of daily exercise; feed her moderately, not with highly stimulating food, but such as will have a tendency to keep the bowels in a soluble condition; allow her daily in the food or water half an ounce of sulphate of soda, with half that quantity of nitrate of potass; give her weekly, or even, as she approaches calving, oftener, from eight to sixteen ounces of Epsom salts along with one or two pounds of treacle dissolved in two bottlefuls of gruel. Should milk be troublesome on the udder, it may be drawn off. Immediately after calving repeat the physic, and continue for a week at least the salt in her food or water, feeding moderately.

In ewes, when suffering from this fever after lamb-

ing, known in them as "inflammation," there is not at first much evidence of pain : they separate themselves from the rest of the flock, have no inclination to feed, but a disposition to remain in one spot, general febrile symptoms, head drooping, with frothy mucous adhering to the angles of the mouth, and general haggard expression of the countenance. There is also occasional swelling and lividity of the external organs of generation, from which there may be a slight discharge. Treatment is with these very unsatisfactory. If attempted, something of a similar nature to that recommended under the abdominal form of this fever in the cow seems to promise the best results. An oleaginous purge, followed by repeated doses of sweet spirits of nitre, Mindereru's spirit, camphor, and tincture of aconite or opium, to which may be added fomentation of the external organs of generation, and a thorough cleansing of the uterus by injections of such disinfecting agents as solution of chloride of zinc, chloride of lime, or permanganate of potass.

In all cases where the disease has unequivocally declared itself, the most careful and energetic employment of means must be adopted to arrest or

circumscribe its progress. As there appear very good reasons for believing that it is capable of propagation by contact, direct as well as indirect, the first step must be the removal of the diseased from amongst the still apparently healthy. It is generally advisable to change even the fold or location of these latter, although the situation to which they are removed is less favourably circumstanced as to shelter, &c., than the one they have left. Any attendant connected with the diseased must on no account undertake the handling of the healthy. As a further precaution against its propagation, it might be advantageous to disinfect those ewes still unaffected which have had contact with the diseased. This can be readily enough accomplished either by taking them into a tolerably close house and exposing them to the fumes of sulphurous acid obtained by burning sulphur, or by means of a watering-pan thoroughly drenching their fleeces with a solution of chloride of lime, permanganate of potass, or carbolic acid.

Although all these things may be done at lambing, and when the disease has declared itself, much more may be accomplished long anterior to this period having a tendency to render these measures

unnecessary. All pregnant animals, as remarked when noticing the treatment of parturient cows, thrive best, and seem least liable to disease, when allowed, especially during the latter period of *gestation*, a fair amount of daily exercise, and food of not too highly stimulating nature, and such as will ensure a regular and healthy action of the bowels; while in many, where a tendency is apparent to plethoric diseases and other affections of the blood, good is occasionally derived from a frequent exhibition of such saline agents—which are readily taken in the food—as sulphate of soda, hyposulphite of soda, or nitrate of potass.

Occurring amongst cows at parturition, and having a resemblance in some of its symptoms, as well as frequently mistaken for one form of *puerperal fever*, is an affection known as “*puerperal paralysis*” or “*loin fallen*.” Ordinarily this is not a fatal disease: it is unattended by fever or general disturbance, and is characterized by partial or more complete loss of motion, and more rarely sensation of the hind extremities. Treatment consists in acting freely on the bowels, and administering twice or thrice daily in ale or gruel such stimulants and tonics as from

two to four drachms each of carbonate of ammonia, gentian, and ginger, together with stimulation of the spine with turpentine liniment.

REARING OF YOUNG STOCK.

WHILE it is undoubtedly certain that the treatment and the condition of the dam are closely connected with the developement and health of the *fœtus*—that a vigorous and healthy mother is more likely to give birth to vigorous and healthy progeny than one in an opposite condition—it is equally deserving of being remembered that of all classes of stock none are more liable to be unfavourably influenced by errors of location and dieting than the young. Want of sufficient shelter, excessive moisture of atmosphere or soil, bad sanitary arrangement of stables, want of space for exercise, together with defective nutriment, are separately, as well as in the aggregate, more damaging in their influence on the young than the adult.

For some time immediately succeeding birth the

young are supplied through the medium of their mother's milk with a nutritive material amply sufficient for all their wants, than which there is no single article of diet possessing in such exact proportions the necessary elements of healthy animal nutrition.

From the subserviency, however, of the domestic animals to the wants and requirements of man, much of the cattle stock of our country is reared without ever enjoying the admitted advantages of directly deriving their support from the dam. They are, in truth, produced rather as a means towards the accomplishment of an end—as a step in the process of maintaining a steady milk supply sufficient to meet the wants of the population—than as a distinct, definite result.

Their rearing is, as a rule, conducted in direct opposition to the indications afforded by a very slight knowledge of the structure and functions of the digestive organs of these young animals. Milk, their natural article of diet, being easy of assimilation, and requiring no remastication, their digestive apparatus, particularly the stomach, is much dissimilar in nature to what it attains in after life ; while, from

the nature of this aliment, and the relations which exist between it and the stomach, it is necessary to the maintenance of healthy functional activity that it should be taken repeatedly in moderate quantities, and by a process requiring the co-operation of several functions.

As, however, the laws which regulate any department of the animal economy cannot be infringed with impunity, but exact with unsparing rigour, as the penalty of this infringement, disease or death, so it is not to be wondered at that a system of dieting completely removed from what is natural should operate perniciously, and with peculiar force, on the constitutions of the young.

Dyspepsia, or a peculiar form of indigestion, always gastric, sometimes intestinal, accompanied most frequently with acute diarrhœa, and known in this form by the characteristic term of "*white scour*," indicative of the colour of the fæces, showing itself during the period of milking in one form or another, is the cause of at least half the mortality occurring amongst this class of stock. The causes of this malady are not to be looked for in the animals themselves, nor are they traceable to any constitu-

tional weakness or structural disease, but to injudicious and extremely unnatural methods of rearing these. Not satisfied with the comparatively slow process of one cow rearing in the season one, or, at the most, two calves, and endeavouring to meet the extra demand for animal food, other methods of rearing these have been adopted.

It is to this artificial system of calf-rearing, and the accompanying injudicious feeding, that the great mortality of young stock may be attributed. That they can be reared by the hand, and with a much smaller per centage of deaths than ordinarily happens, there is little doubt. By the system of dieting, however, which is almost universally pursued, the whole process of digestion is perverted : not only is the quality of the aliment which is given wrong, but the quantity and manner of giving it is absurd. That the dieting is principally at fault is obvious when we consider that the affection is almost unknown amongst those drawing their milk from the dam, or amongst lambs, save when these latter are reared by the hand, in which case they are alike liable, and exhibit the same symptoms. In the ordinary method of rearing calves, milk, the material

most perfectly fitted for their nutrition, is even dispensed with, or too often merely employed to flavour some less nutritious, but commercially cheaper, material. Irish moss, linseed, and pea meal are all employed as feeding materials, generally alone, not as they ought to be, mixed, in varying proportions to meet the requirements of the animal, and are frequently prepared in such quantities as will suffice for feeding the animals for two days. Thus the material is not even given in its most wholesome form, but allowed to stand until sour from fermentation.

In those cases, again, where milk is given in entirety, the little creatures are fed from a pail, each endeavouring, by a succession of greedy gulps, to obtain as much as possible to compensate for a lengthened fast, the stronger of course obtaining the larger share. They are rarely fed four times daily, generally not so often. The milk is in this way swallowed or gulped, certainly not sucked, and the quantity is much more than the stomach is fitted to act upon, added to which the whole process of insalivation, so necessary to healthy digestion, is dispensed with. The milk, on entering the stomach,

is quickly enough curdled, not merely from the natural free acid present, but from having in addition the sour fluid resulting from an already imperfectly digested meal. The coats of the organ, from this gradual accumulation of material, become abnormally distended, and gradually paralysed. No sooner, however, is the natural tone and contractility of the stomach gone or impaired, and its functions arrested, than the contained material becomes subject to alterations consequent on the operation of chemical laws : the mass is gradually softened, broken up, and mixed with the more fluid material surrounding it, giving rise, in its passage along the canal, to that train of symptoms characteristic of the disease.

Much of the annoyance and loss almost universally associated with the hand rearing of calves might be avoided by a strict attention to a properly regulated, and as natural as possible, system of dieting. If at all possible calves ought to have milk for at least three months, and while receiving this milk they ought to have the opportunity of partaking of a little hay, sliced roots of some kind, and good linseed cake. The youngest ought to have their milk from the most recently-calved cow. The intervals allowed

to elapse between the feeding times ought to be much abridged. For the first month of their life milk should be offered them at least four times daily—oftener is better; while it is advisable to keep the animals rather pinched than by a mistaken kindness to fill the stomach to repletion.

In giving calves their milk from the pail thus often, it requires certainly much time, and, where many are to be fed, much tact, in order to induce them to suck the milk through the action of the finger in the mouth. As a substitute for this, and with a view to the obtaining of the beneficial results of insalivation, I may here mention a very simple device for feeding them, which I have seen adopted with success. The calves were arranged in paddocks separately, these paddocks or boxes occupying two sides of a passage. At the divisions between the individual boxes, situated at a convenient height from the ground, was strapped a semi-circular tin box, with its bottom to the wood, of such a capacity as to hold milk sufficient for one meal for two calves. The exposed semi-circular surface had two small tubes, projecting severally into the boxes between which it was situated, and

attached to these nozzles was a piece of chamois leather or gutta percha tube having a small external orifice. The milk, to the quantity desired, was poured into these tins; while the animals, by a very little education, soon acquired the habit of seizing hold of this artificial teat, and by a gentle sucking action readily appropriated the contents of the feeding tins. It must be observed that the apparatus requires to be kept scrupulously clean; and also, if the calves are guilty of pulling at them, to have the tubes removed between feeding times. This, I may repeat, is no ingenious suggestion, as I have seen it in actual operation; while I can testify that the mortality amongst animals thus fed was much below the average. Where milk cannot be procured, or only in limited quantity, a tolerable substitute or addition may be formed by treating with hot water, so as to form a thin jelly, two parts of bruised linseed or linseed cake and one part of pea meal—if not liquid enough it may be further diluted with water or milk—and have added to it for each calf one or two eggs well whipped twice or thrice daily. Subsequent to weaning, or between this and the period when animals are more immediately expected to

fulfil the purposes for which they are bred—in the horse when he is able to work, in other animals when employed for breeding or feeding purposes—much damage is produced by scanty or injudicious dieting.

It seems to be an opinion too commonly entertained amongst many who rear stock that it is quite immaterial what young animals receive as food, provided they are kept “going on,” as this condition of life is termed: much nearer the truth would it be were they to use, instead of the term “going on,” that of “from starvation.” They seem to forget that it is during this period the animals are perfecting their developement of the different organs and tissues of the body, and that the nutritive material essential for this building up of bone, muscle, sinew, &c., is only to be obtained from the food which is taken into the system.

There is no more false economy than that of stinting young animals in regard to diet. It impedes and dwarfs their natural developement, weakens the constitution, and sows the seeds of disease, which require only the favouring influence of time and circumstance to ripen into maturity. It may seem

expensive when animals are not yielding for this liberal treatment an immediate return; nevertheless it will ultimately be found the cheapest.

Amongst certain classes of horses, when placed on liberal diet and active work, many of those annoying skin affections, dropsical limbs, and ever-recurring attacks of indigestion and other bowel complaints, together with many other diseases ordinarily considered as local, may not improperly be referred to meagre dieting during early life, as the most frequent predisposing cause; while amongst cattle and sheep the major portion of that fatal class of blood diseases represented by quarter ill and braxy, bear a similar relation to deficient early nutrition.

In sheep—the shortest lived of our domestic animals, and which are hurried rapidly through every stage of life until they reach the shambles—the evil results of errors in early dieting are most distinctly marked, and occasionally attain an alarming magnitude.

It is a well-understood fact that, under favourable circumstances, lambs, when separated from the ewes, are much benefited by a change to pastures other

than those on which they have been bred. So thoroughly alive are the breeders of sheep to the beneficial results of such a change that it is too often made without their having taken sufficient trouble to inform themselves whether or not, in its main features, this change is likely to answer their requirements—whether there is food sufficient and of such quality that they shall not actually lose condition, or receive any decided check or arrestment in their growth. In those cases where the nutriment received is insufficient for the healthy maintenance and steadily progressive growth of these young animals—where the system, for its support, has to fall back upon itself—the evil results of this retrograde or wasting process, with the exception of the impairment of condition, are not at first very obvious; but, if persisted in, irritability and derangement of the digestive organs, with even more serious results, are certain to follow. The most damaging consequences are, however, delayed until removed from this stinting, and placed on a more liberal diet, most probably turnips. Here the sudden increase of nutritive material is almost certain to produce an increase of mortality, either through affections of the digestive

organs—those most directly connected with the reception of this increase of nutriment—or owing to the lax and immature nature of all the tissues, from the sudden appearance of some of those destructive blood diseases in which extravasation of the circulating fluid is a marked feature. The already depressed vital energies are unable successfully to deal with great and sudden changes either in quantity or nutritive quality of aliment, the healthy balance naturally subsisting amongst the several animal functions is disturbed or destroyed, and disease at one or more of the steps in the process of food assimilation is more than likely to occur.

Much of this might be prevented if, instead of allowing young animals to receive great and sudden checks in their developement, they were kept gradually but steadily improving, or if they did lose condition, that its recovery were not attempted by a sudden effort and at once, but rather by means gradually progressive. No great change, either as regards locating or dieting young animals, ought to be undertaken without an endeavour being made to accommodate the system to such alterations.

EPIZOOTIC AND ENZOOTIC DISEASES.

THE ordinary difficulties occurring when attempting to define or circumscribe any generic term are found particularly annoying when we have to deal with such terms as *epizootic* and *enzootic*.

Any disease appearing amongst animals, other than men, when spread over a considerable tract of country, and affecting a number of the same species at the same time, and which, as far as we are able to discover, is unconnected as an immediate cause with local influences or dietetic arrangements, is ordinarily termed an *epizootic*. To this definition there are exceptions, while by general consent the term is restricted to those wide-spread animal fevers, *rinderpest* (cattle plague), *pleuro-pneumonia epizootica* (the contagious lung-fever of cattle), *epizootic aphtha* (foot-

and-mouth disease), and *variola ovina* (small-pox in sheep), known only to us as the result of the dissemination and multiplication of the germs or morbid matter of these specific diseased conditions, and which, wherever they have appeared, have attracted universal attention. When disease, although general as to individuals, is circumscribed by locality, and distinctly traceable to influences peculiar to that locality—as geological formation, temperature, condition of soil, nature and quantities of the food supplies, &c.—it is described as being *enzootic*. The diseases grouped under these classes are the most important to which our domestic animals are liable. Amongst cattle and sheep they are the cause of probably three-fourths of the mortality.

At all times, and in every country, cattle plagues have been an object of interest alike to the stock-owner and political economist—the former from the involvement of individual interests, the latter from their affecting the material wealth and increase of the population. Impoverishing nations, pre-disposing to or actually inducing disease and death in populations, their occurrence has most justly been looked upon as little short, in their evil results, of the

devastating effects of war, associated with or as a sequel of which they are not seldom found to appear. Considering the nature of the climate, the ratio at which the population is increasing, and the nature of their work, there is probably no country which can less afford to be indifferent to the nature of epizootic and enzootic diseases, and the laws which regulate their appearance and propagation, than Great Britain. While knowing that none of these terrible cattle epizootics are indigenous to her soil, is there any country where the energetic carrying out of rational preventive measures would be followed with more beneficial results? No doubt, there are large and important interests connected with this question, which, wherever it receives a national consideration, require a careful and judicious handling; while not the least of the obstacles in the way of a rapid adjustment of the matter is the difficulty of bringing home to the mind of the general public the difference there is between free trade in cattle and free trade in disease, with the difficulties which exist in obtaining the former apart from the latter.

For a considerable number of years—dating from

1841 and the impetus then given to the foreign cattle trade by the removal of certain previously-existing restrictions—on to the present, there has occurred at irregular intervals very aggravated outbreaks of the contagious lung-disease of cattle, frequently accompanied by the more manageable foot-and-mouth disease. Now, although it may with truth be affirmed that since its introduction or first appearance in this country, contagious pleuropneumonia has never been entirely banished, it is yet no less certain that every fresh exacerbation of the disease over the entire country, or any large district of it, has been distinctly traceable to fresh importations of foreign cattle.

More recently, and, as all evidence seems to substantiate, derived from the same source—contagion propagated by imported cattle,—the herds in many districts of Great Britain were threatened with extermination from that terrible scourge of the race known variously by the names of rinderpest or cattle plague, and which was only banished from the country by slaughtering of the contaminated and the enforcement of stringent prohibitory measures regarding the admixture of imported with

home-bred stock. The extent of our railway communication, and the facilities with which stock can be moved from the ports of debarkation to districts inland, operate powerfully towards the distribution of these contagious epizootics. The evil, however, does not stop with contaminated railway carriages, the damage being indefinitely extended over the country from the travelling along and resting upon our country roads, to accommodate our local fairs and weekly markets, where, without respect of where they have been brought from, all are indiscriminately ranked together. The fences separating our fields from the parish and turnpike roads are seldom or never sufficient to prevent animals leisurely passing along these having direct contact with such stock as may be pasturing in the fields adjoining. There is little doubt that our feeders and breeders of stock are anything but indifferent to the consideration of these scourges. To be indifferent to their consideration is to be indifferent to their own interests. More meat and more manure is the cry which is heard loudest from the ablest of our agriculturists, those whose eyes are open to the requirements of the day. The produc-

tion of grain is, and has been for some time, a matter of secondary importance. The most approved methods whereby the greatest amount of beef and mutton may be produced from a given number of acres have by far the best chance of gaining a hearing from our British farmers. In truth, we seem but in the infancy of our knowledge and appliances in much that relates to the feeding of animals. I have ever thought that it is an extremely hard condition that the man who is so smartly treated if attempting to dispose of his ox which has become a victim of pleuro-pneumonia, should receive so little assistance from that same law which punishes, in the protection of his stock from disease; more, that it is decidedly unfair to permit the dissemination of diseased cattle over the entire country, and then punish those who, from no fault of their own, are endeavouring to make the most of a misfortune. I do not put this forward as a plea for the traffic in diseased animal food, but merely state the case as it may be viewed by any one from an unprejudiced point of view.

Nor can I understand, on the other hand, how our stockowners have been so apt to fancy that those

who have approached this subject with a view to a calm investigation of its causes and remedy were so many bitter foes leagued against their interests. No doubt, in the consideration of this question, there are many difficulties, but why should they be deemed insurmountable? An inspection of imported cattle, it is understood, does exist; but it is evidently worthless for the accomplishment of the end in view. Nor will any mere inspection ever succeed much better. The most any inspection without some quarantine can accomplish is the detection and detention of the actually diseased; but in how many instances are animals passed as sound in which disease is latent, not to be developed in obvious symptoms for many weeks and under favourable circumstances? Doubtless many will say we may as well prohibit the importation of foreign stock as establish a quarantine sufficient to guard against the contaminations of such a disease as pleuro-pneumonia. If this should be the case, rather let us have no importation of live stock than the periodic outbreaks of these direful scourges as we have already experienced them. For there are considerable doubts if we do not lose more from one disease, pleuro-

pneumonia, alone, than all we gain by the live cattle we import.

A plan certainly much safer than that at present acted upon, and one which, in a short time, would most perfectly adapt itself to the circumstances and the supply of our wants, and which, as regards its reasonableness and feasibility, the more intelligent of those who have given much attention to the subject are gradually becoming convinced is, in our present circumstances, the best which could be adopted, is the compulsory landing of all foreign stock at certain specified ports, with their enforced slaughtering there within a definite period after debarkation—the hides and offal not to be removed until disinfected, and under the authority of a qualified officer.

So long as there is allowed an indiscriminate importation and distribution over the country of stock suffering from contagious epizootics, no amount of individual or associated exertion will ever perceptibly lessen the mortality arising from these plagues; while the minds of our stockowners will ever be periodically subject to harassing anxieties, and their pockets to rapid draining off of their contents. It is from our legislature that we must look for any assistance

worth being entertained; while probably the time is not far distant when, even if unwilling, the Government may be forced to give the whole question a fair consideration, and this the more readily seeing it is so intimately connected with the solution of some other questions more easily understood as important, such as, How is our increasing population to find a suitable and pecuniary-reasonable supply of animal food? or, What is the relationship subsisting between the diseases of the great centres of our population and the nature of the food with which they are supplied?

Enzootic diseases—those which, although occurring amongst a number of animals at the same time, are yet circumscribed by locality, and are directly traceable to influences local or dietetic—notwithstanding their acknowledged importance and undoubted amenability to properly-directed preventive treatment, have not received the attention which, from these circumstances, they deserve. In certain situations and amongst particular animals—sheep, for example—their appearance is characterized by even a greater mortality than the contagious epizootics

already spoken of. Unlike these plagues, they are not in this country, and as a rule, considered as propagated by contagion, although in other countries of Europe, many of them—the *anthracoid*, for example—are understood and spoken of as decidedly contagious. In their origin and special peculiarities traceable to influences artificial as well as natural, to geological formations, meteorological conditions, character of soils and the nature of their products—the vast changes which modern scientific agriculture has induced during the last half century, as well in regard to the condition of soils and their crops, as to the variations in type and constitutional peculiarities of our domestic animals—this class of diseases has probably rather increased than diminished.

It is an acknowledged fact that in proportion as we interfere with the natural habits of any animal, the farther we remove them from what may be looked upon as their natural or more primitive condition, so do we increase their susceptibility to disease, and lessen their power of resisting its inroads. All, however, of the advances which have been made towards the improvement of the different varieties of our domestic animals are based on this very inter-

ference. However, in this selection of stock animals, and direction of their reproduction and developement, there has been too often left out of reckoning the fact that, to attain the maximum of success in this breeding and rearing of stock, there must exist a just relationship between the animals we possess and the external circumstances—climatic, local, and dietetic—to which they are subjected. There are certain general laws easy enough of discovery, in accordance with which healthy animal existence is maintained, but which cannot be ignored or trampled upon with impunity. Other influences of an adverse character, but less patent as to their nature and mode of operation, occasionally do occur, resulting in disease and death, thereby thwarting expectations in the production and rearing of stock. These too, however, we may confidently anticipate, will yield their secrets to patient, well-directed investigation.

Many of those causes classed as natural—geological formation, altitude, temperature, condition of soil, &c.—operating locally in the production of disease, have by actual experiment and experience been proved to be capable of alteration or great amelioration; and surely the artificial—such as are associated

with reproduction, dieting, &c.—are not less so. Let it be remembered that animals, like ourselves, are vital organisms, not mechanical machines merely—that they are acutely sensitive to every influence, material as well as artificial—that our interference, to be void of danger, must be an interference directed by judgment and based on ascertained fact rather than speculative hypothesis, or a blind reaching after ends certainly unattainable by the means adopted. Enzootic diseases are less frequent amongst horses than cattle, and are most prevalent and fatal with sheep and swine.

By some of the many forms of that group or subdivision known by the term of *anthrax fever*, which includes such diseases as *splenic apoplexy*, *quarter ill*, *braxy*, &c., many thousands of the best animals in certain classes of both cattle and sheep are yearly destroyed. In certain circumstances the flesh of animals dying from many of these affections is employed with impunity for human food. There are, however, peculiar conditions when the consumption of this flesh is certain to be attended with bad, if not dangerous results, anthrax being in these circumstances a virulent poison. The immediate cause

of anthrax, in all its forms, is a diseased or vitiated condition of the circulating blood—a change in its physical, chemical, and physiological characters by which it is rendered unfit for its normal functions of nutrition—remaining, however, not merely inert, but becoming actively poisonous, in certain cases leaving its natural conduits, and then becoming rapidly subject to ordinary chemical laws. The causes operating in the production of this loss of equilibrium amongst the constituent elements of the blood, and the relationships which in health exist between the blood, the blood-vessels, and surrounding tissues, are somewhat difficult to trace and explain; yet upon their being to a certain extent understood, or at least acted upon, depends the success of those methods of dieting conservative of health, and of those principles of treatment calculated to arrest or circumscribe disease. Speaking generally, the causes which tend to the production of this entire group of blood diseases, from which such numbers of our animals of all ages are lost, may be said to be associated—

1st. With the character and conditions of soil and its manurial richness, by which is materially modified

both root crops and grass. They are more prevalent in rich lands when undrained, and on naturally dry soils in damp seasons when the temperature is high.

2*d.* With a state of plethora or redundancy of rich circulating blood in the animals themselves, more particularly when this advance in condition is preceded by a previous stinting or lowering—when the stock have been removed from a comparatively sparse diet, or one poor in nutritious materials, to decided abundance or of a highly nutritive nature.

3*d.* When this free supply of food is so provided that the animals have no necessity to take even moderate exercise in order to procure this, or when, from want of space, this is impossible. This condition is extremely prejudicial to pregnant ewes, particularly as relates to the progeny, and in them is a fertile source of that fatal congestive fever occasionally met with.

4*th.* Altitude and exposure, by which sudden checks are experienced from the rapid alternations of the weather. This is most noticeable in our most exposed sheep walks, where, it is well known, a sudden change of weather, as an unexpected snow-

blast, determines the production of many cases of braxy.

It is quite certain that much more might be understood both as to the nature, origin, and mode of developement of the entire class of enzootic diseases were greater inducements held out to cultivate their investigation in those classes of our stock amongst which they are most prevalent; while, from what is known, there is little doubt that were the knowledge possessed acted upon, the mortality in every class of stock from these very diseases might be much curtailed. Errors in dieting, and an absence of that just relationship which ought to subsist between external local influences and the character of the stock reared, are the main causes of the occasional undue prevalence of these diseases.

Stockowners, in their anxiety to attain a given end, are too apt to forget that the laws in accordance with which healthy animal existence is maintained cannot be infringed without the penalty for this infringement being exacted in the form of increased sickness and a higher death-rate—that neither young animals, nor those which have reached maturity, especially if previously below par, can

without risk be put at once upon a diet unrestricted in amount and increased as to its nutritive qualities, and this more particularly under certain influences of climate and locality. Sheep, which are probably more manipulated, so to speak, than others of our domestic animals, when subjected to these conditions will mainly suffer from affections of the digestive organs, or some of those fatal anthracoid or blood diseases already spoken of. In breeding animals—ewes—the results of these same errors are not confined to themselves, or exhibited chiefly at the critical period of their lives, the period of parturition : they are carried further, and from the delicacy of the organism, and other collateral circumstances, have a more extensive fulfilment in the case of their lambs. When errors in dieting are associated with want of adaptability of the stock to the lands and situation in which they are placed, the results are disappointing in the extreme. In these circumstances it is impossible to bring high-bred and high-class stock to perfection, or to render their breeding or rearing a remunerative undertaking.

Another point deserving of notice, as showing the difficulty there exists of successfully dealing with

adverse local influences is, that it not unfrequently happens that on those lands which, from the nature of their soil, their altitude, or climate, are ill adapted to the class of stock there located, that the very means which are employed to combat these obvious defects seem also to operate in influencing the appearance, or at least in increasing the severity when they do appear, of certain diseased conditions, particularly in the young. There is no doubt but that these same diseases are met with where external circumstances are most favourable, and nicely adapted to the animals placed under their influence; but in such cases they are not so extensively distributed, nor yet of so malignant a character.

Again, if we add to these conditions of adverse local influences and faulty dietetic arrangements, the item of hereditary disease, resulting from mistakes as to breeding—*i.e.*, the employing as stock animals such as suffer from or exhibit any constitutional weakness or predisposition to disease—we thus bring together all the principal necessary conditions for the developement of certain of the most widely-spread and fatal enzootics to which our stocks are subject.

Scrofulous and rheumatic diseases, which occasionally occur amongst all our better-class stock, may, in all their extraordinary outbreaks, be traced to a co-operation of these different causes.

There is no doubt but that the principal and predisposing cause of these diseases is the constitutional *cachexy* or taint; still, it must be remembered this taint is not of an invariable uniformity of virulence, and when slight, and external circumstances are propitious, may escape the notice of the most acute observer, never in the slightest degree interfering with the growth of the animal, or only shewing itself in isolated cases. There is also this fact to be borne in mind, that it is no uncommon circumstance for either of these constitutional diseases to disappear in one generation and reappear with greater virulence in a succeeding, or, it may be, supplanted by an affection somewhat analagous, or merely by a variation of the leading or constitutional disease. Placed, however, under conditions of diet, situation, and climate favourable to their appearance, these *cachexies*—scrofula and rheumatism—assume the position of most deadly enzootics.

Both these constitutional diseases are characterized

by the facility with which they become developed under the smallest exciting cause. Where the constitutional or hereditary taint exists, they are most surely exhibited in connection with those causes which, as a general rule, are antagonistic to good health in all animals. Amongst young cattle there is no more fertile source of these maladies than a defective sanitary condition of their houses. Dark, ill ventilated, undrained, filthy paddocks are not at all fitted for the rearing of healthy stock. Even when possessed of robust, healthy constitutions, this, in conjunction with improper alimentation—which they too often receive—is sufficient to develop the worst forms of rheumatic and scrofulous disease; while, if they are possessed of any constitutional tendency to disease, it is rather to be wondered at that any escape. The animals being young, all those functions subservient to the growth of the body are in the most vigorous operation, this functional activity merely rendering them more susceptible of disease. The small amount of exercise they are enabled to obtain is injurious, from the compelled inactivity to which the joints are subjected; while it not unfrequently happens that they are

turned, in a great hurry, without preparation, from too warm paddocks and close confinement into the open air and perfect liberty: the transition is too great both as to temperature and exertion.

Amongst sheep stock those causes which seem to operate as exciting agents in the production of these enzootics may be referred generally to atmospheric influence, location, and nutrition.

Atmospheric influence is a term of much ambiguity, and employed too often to veil our ignorance: the laws by which this is regulated are still much obscured or little understood: so, when brought to a stand-still in our investigation of results, we too often fall back on this very convenient term. We know these must have some definite cause or causes from which to originate, and not being able to lay our finger on the better understood, are apt to assign them to those whose nature and operations are more doubtful and difficult to elucidate.

Still, there are certain conditions of the atmosphere—as its temperature, its moisture or dryness, &c.—the action of which we can with tolerable certainty predict. Even when young, lambs can with impunity endure a comparatively low tempera-

ture if unaccompanied with moisture. When, however, a damp lair is added to a dry frost wind, a very active exciting cause of rheumatic inflammation exists. The little animals are inclined to lie, the circulation becomes flagging, and if there exists the slightest constitutional diathesis, the system rapidly succumbs.

A deficiency of shelter and a naturally damp condition of soil will further tend to ensure an earlier and more confirmed form of the malady.

If, in addition to these causes, there is a defective or perverted nutrition, which may have originated with the lambs during intra-uterine life, as well as subsequent to birth, then we have the most favourable condition for the appearance of scrofulous disease.

In connection with enzootic diseases, and interesting as exhibiting the intimate connection subsisting between these, and accompanying peculiar local influences, is the fact that in the progress of modern agriculture it not unfrequently happens that soils which for generations have supported a healthy sheep stock have, in the course of being improved, become undesirably conspicuous for the prevalence of diseases previously there unknown. This is particularly

evidenced by the appearance of certain diseases of the bones and nervous system following the improvement of light moory soils. And while it may be impossible exactly to determine the precise amount of influence which ought to be accorded to each step in the process of improvement—whether the cause must be assigned to what has been added to the soil, what has been merely brought into action which previously was in existence, although in a dormant state, or to some new agency resulting from the combination of the former, and entirely dissimilar in its nature to either—it is yet satisfactory to know that these diseases may be curtailed or altogether prevented by regulating our management in accordance with the knowledge that these only appear when particular soils are subjected to certain conditions, and that they only or chiefly occur in particular classes at particular periods of their lives, when pastured or fed on material grown on these lands. Again, the very period during which these diseases continue, at least in marked ascendancy, most unmistakeably points them out as not purely adventitious, but as being in much subject to control. For a time they are of frequent occurrence and fatal

in their results, gradually, however, becoming mitigated, or lost sight of altogether as these soils revert to their former condition—as the period becomes more distant from the date of improvement.

THE MANAGEMENT OF DISEASE.

WE will not here attempt a definition of disease or its opposite, health, taking it for granted that the terms are sufficiently well understood to enable all to comprehend anything which may be said relative to those general principles by which it is advisable the conduct of those who have the charge of animals should be regulated in their endeavours to remove the abnormal conditions recognised as disease.

By general consent, the maintenance of health is regarded as the attainment of perfection in all that relates to the management of our domestic animals. Many, however, under whose care these animals are placed, not satisfied when this desired result is attained through a judicious system of dietary, correct location, and sanitary arrangements, with other de-

tails of good management, fancy that this condition of health may be improved and rendered permanent by the repeated exhibition of certain medicinal agents. Horses are more subject to this meddlesome medical interference than other animals, probably from their associations with us being closer and more extensive ; while from the extent of this interference, and the obstinacy with which it is carried out, more evils result than is generally imagined. The pertinacity which is shown in the regular periodic physicking of horses, notwithstanding all the arguments which may be adduced to prove its fallacy, and the implicit faith which so many place in anything in the form of medicine to achieve the most extraordinary results, would in itself be simply amusing were it not for the damaging consequences which result to the animals thus experimented upon.

Tartar emetic, nitrate of potass, and sulphuret of antimony may be very useful articles in certain conditions of disease, but are certainly uncalled for either in horses or other animals in the enjoyment of health—in which state, when given, they are more likely, from their depressing action, to be productive of evil than of good results. The continuous em-

ployment of agents calculated to produce an effect on the constitution ought not to be entered upon with any animal without consideration, and an amount of knowledge relative to those agents, and their effect upon the animal system, not to be looked for in any save those specially trained for that end, and who are daily practically applying this knowledge.

To infer from this, however, that none but a professional man ought in any case to prescribe for the ailments of our domestic animals would be both foolish and dangerous. Many of these, particularly in horses, and connected with the digestive organs, are sudden in their appearance, and in the early stages generally amenable to treatment of a comparatively simple nature. There are few stockowners who are not practically aware of the value of such agents as linseed oil, sweet spirits of nitre, laudanum, ammonia, or spirits of turpentine in such cases as colic and indigestion in both horses and cattle.

Blood-letting, that potent agent for good or evil, is in our day scarcely looked upon with the veneration formerly bestowed upon it, or employed as a panacea for all the ills to which animals are heir.

There are, no doubt, still to be found, even among the better informed, individuals who in every fatal case solace themselves with the reflection, that the animal at all events was bled. To those who are not skilled enough to be guided by more recondite rules in the performance of this operation, a very safe one may be obtained by remembering that the practice is, as a rule, inadmissible when the disease is gradual of developement, passing quietly though steadily from slight indisposition to actual disease, and that its performance is likely to be comparatively harmless, or productive of benefit, when the affection is sudden in its onset, rushing rapidly through preliminary stages to the height of its developement. Partaking of the former character will be found those diseases of an epizootic type, and marked by febrile symptoms of a low and exhaustive nature. Examples of the latter are to be found in the acute inflammatory and congestive actions of the organs of digestion and respiration.

Apart from medical treatment, the first step in the management of disease is naturally the separation of the sick from the healthy. This is the more

imperative when the disease is of an infectious nature, capable of propagation by the emanations from the actually diseased. As tending to favour recovery, as well as reduce the risks of contamination to the minimum, a good loose-box is preferable to a stall or open yard : it ought to be placed as much as possible separate from the stabling of other animals, to be well lighted, roomy, dry, and well ventilated. Attendants who minister to sick animals ought to be careful how they immediately afterwards move amongst the healthy ; while all utensils and clothing, &c., used for the sick, ought to be strictly reserved for them until properly cleaned or disinfected. In cases of prolonged illness, much benefit is derived from turning the litter of the sick-box twice daily, thoroughly sweeping the floor, and, before relittering, sprinkling it with such disinfecting materials as chloride of lime, Condry's fluid, dilute carbolic, or sulphurous acids. Where clothing is employed it ought to be removed morning and evening, be well shaken and hung in the open air, or exposed to the fumes of burning sulphur ; and before being replaced gently wipe the animal over with a towel or damp wisp. Where water is

allowed *ad libitum* it ought to be changed once or twice daily.

While it does not appear that the custom of strictly confining sick animals to tepid water, or even well-boiled gruel, is productive of that amount of benefit some seem to imagine, plain cold water is in many cases not only more grateful, but more beneficial, than aught else we can give.

The food which is given ought to be light—in its nature easy of digestion, small in quantity, offered more frequently than in health, and in whatever form the caprice of the appetite seems to dictate, endeavouring if possible to keep the bowels in a natural and moist condition.

Other instructions, dietetic, &c., belong more properly to special professional advice.

When it is determined to call a veterinary surgeon, let it be done as early as possible, rather than delay until the case is evidently hopeless; and when called, by all means give him a full and particular history of the case, with an unreserved statement of what has already been done for it. Whatever he prescribes or orders medicinally, dietetically, or otherwise ought to be scrupulously attended to, ever remembering

that it is upon a strict attention to these matters that any hope he may entertain of a favourable issue is based.

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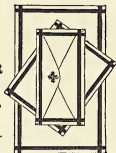


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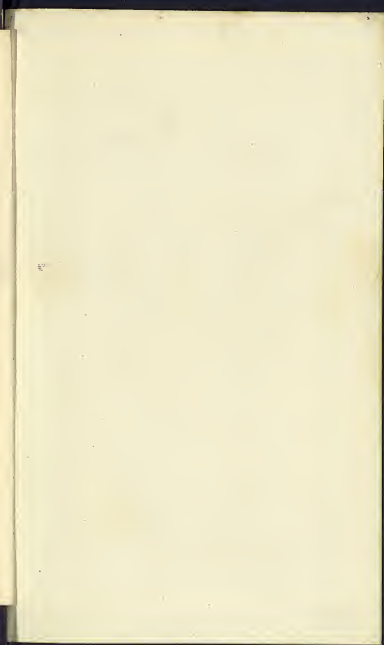
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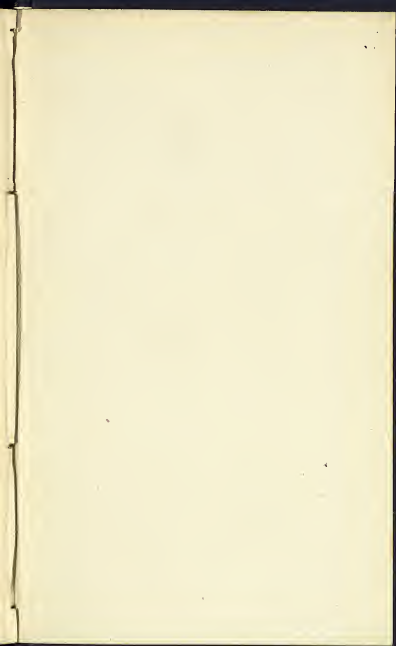
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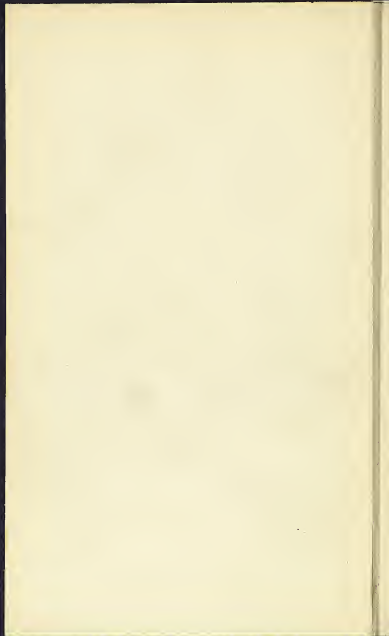
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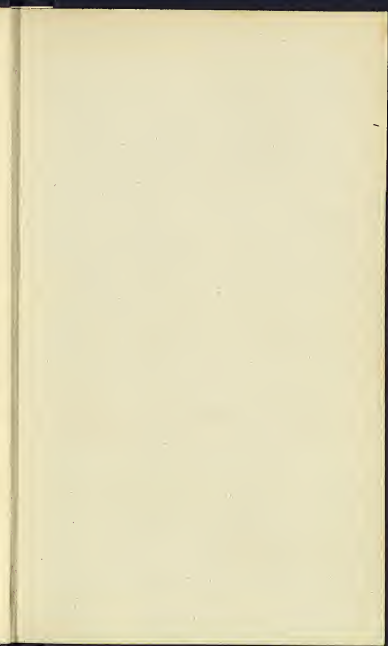
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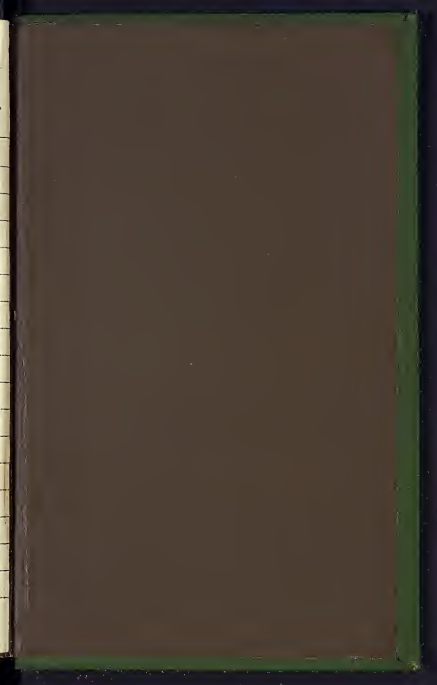


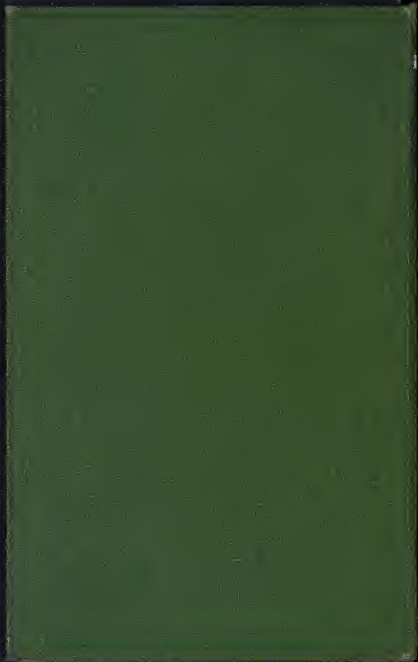


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